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OBSERVATIONS ON THE SPRING MIGRATION
(1910) AT ANN ARBOR, MICHIGAN.

BY A. D. TINKER.

The following series of notes is a compilation of the records secured by Messrs. N. A. Wood, F. O. Novy, and the writer during the past spring. One or another of the party, and sometimes all, were in the field daily from the first of March to the last of May, making observations on the progress of the migration and taking specimens of the rarer species. Nearly all of the field work was done in the immediate vicinity of Ann Arbor. Mr. Wood made an occasional trip to Portage Lake, Washtenaw County, securing records of water-birds that otherwise would not have been noted.

A great many of the weather conditions prevalent during the spring of 1910 were quite similar to those of the corresponding season of 1907. However, the cold waves this year did not have the same effect upon the migration as in 1907. It will be well remembered that during that spring bird-life in general, and warblers in particular, were very abundant here and prolonged their stay to an unusual extent. This was especially true of the later migrants (Wood—Auk, vol. xxv, page 10). But this year there was no such abundance of individuals of the various species, although about the usual number of species were recorded. In fact, the migrants last to arrive, that is the great majority of the warblers, and some of the sparrows and thrushes, were rather scarce, while others were not noted at all. Whether this discrepancy was due to the destructive force of the heavy storms that took place along the Gulf States when the migration was at its height in that region or not must remain an open question. It is also quite possible that other forces combined to influence the migrating hosts to such an extent as to cause them to pass on without stopping here, as is their custom. Whatever the causes may have been, field-work throughout the entire season gave abundant evidence of the fact that there was a great falling off in the number of individuals of some of the species.

The first positive evidence of the spring migration was recorded on March 2 and 3, when there was a decided rise in the temperature, resulting in the disappearance of nearly all of the snow, and by the sixth of the month the open ground was free from snow. From the first to the sixth the prevailing winds were southerly, and during this period the Belted Kingfisher, Red-winged Blackbird, Marsh Hawk, Robin, Bluebird, Killdeer, Meadowlark, Mourning Dove, Cedar Waxwing, Canada Goose, Bronzed Grackle, American Golden-eye, and Canvas-back Ducks made their appearance. This constituted the first bird-wave of the season.

On March 7 there was a return of low temperature and northerly winds, with frequent snow flurries, practically putting a stop to all northward movements of the birds. March 10 witnessed a return of mild weather, which continued, with some slight changes, throughout the balance of the month. During this period from March 7 to 30 there was a gradual movement of the birds to the north, with heavier waves of migration on March 10, 19, 25, 27 and 28. None of these, however, brought in as many new arrivals as the first wave of the season. The total number of new arrivals noted during March was thirty-seven. The entire month was warm and remarkably free from the sudden changes which usually make the month so disagreeable in this latitude. On the 30th there was a cold wave, with heavy frosts on the evening of the 31st.

April opened fair and warm, with south-west winds, but on the 7th there was a return of cold weather, with heavy frosts. However, on the 8th there was a warm wave, which continued, with some slight variations, up to the 16th of the month, when low temperatures prevailed again. This cold wave remained in force until the 29th, after which it was warm for the balance of the month. There was a steady migration throughout the entire month, but no decided waves were recorded until April 12, and then not again until the 16th. The heaviest migration wave during the entire month took place on the 30th, when eight new species were recorded and the

ranks of the ones already on the ground were greatly augmented. During the entire month forty-four new arrivals were noted, only seven more than were recorded in March, which had an exceptionally large number this year.

The first three days of May were rather unfavorable to migration, but on the fourth there was a warm wave, which brought in six new migrants and added greatly to the species already here. This warm weather continuing to the twelfth resulted in a steady migration, which apparently reached its height on the evening of the 10th. A cold wave struck here on the 12th, but was replaced by a warm one on the evening of the 13th. With slight variations the balance of the month was fairly warm and favorable to migration. During the entire month fifty-six new arrivals were recorded, some of which, as the Least Flycatcher, Sharp-shinned Hawk, Catbird, and Baltimore Oriole should have been noted during the latter half of April. There was a general migratory movement throughout the month, but the heaviest waves occurred on the 4th, 8th, 11th, 14th, 15th, 16th, 17th and 21st, and the last new arrival was noted on June 2. Although about the usual number of migrants were recorded during May there was a remarkable scarcity of individuals among a great many of the species. This was especially noticeable in the Magnolia, Chestnut-sided, Palm, Black-throated Blue, Tennessee, and Wilson warblers, as well as the Grey-cheeked Thrush, Dickcissel, and Least Flycatcher. On the other hand the Blue-headed Vireo, Bay-breasted Warbler, Golden-winged Warbler, and Grasshopper Sparrow were unusually numerous. But very few of the warblers prolonged their stay beyond the usual period, and the majority were here only a short time.

In the following list of 141 migrants the various species are arranged in the order of their arrival, the dates given being the earliest record for the year. Species marked with an -*- occur in limited numbers as winter residents, rendering it very difficult to determine the exact date of the first migrating individuals of these species. In view of this the

dates given after such species are approximately those of the first migrants. The 1909 and 1908 records are given as a basis for comparison.

LIST OF MIGRANTS.

	1910	1909	1908
*Prairie Horned Lark	Feb. 27	Mar. 7	Mar. 10
*Belted Kingfisher	Mar. 2	Mar. 27	Mar. 21
Red-winged Blackbird	Mar. 3	Mar. 6	Mar. 8
Marsh Hawk	Mar. 3	Mar. 2	Mar. 8
*Robin	Mar. 4	Mar. 4	Mar. 5
Bluebird	Mar. 4	Mar. 4	Mar. 8
Killdeer	Mar. 4	Mar. 6	Mar. 12
*Meadowlark	Mar. 5	Mar. 1	Mar. 8
*Flicker (Northern)	Mar. 5	Mar. 6	Mar. 22
*Mourning Dove	Mar. 5	Feb. 22	Mar. 18
*Cedar Waxwing	Mar. 5	Feb. 28	Mar. 8
Canada Goose	Mar. 5	Mar. 20	Feb. 16
Bronzed Grackle	Mar. 5	Mar. 7	Mar. 9
Golden-eye	Mar. 6	Mar. 7	Mar. 9
*Crow	Mar. 6	Feb. 21	Mar. 8
Canvas-back Duck	Mar. 6		Apr. 4
*Song Sparrow	Mar. 6	Feb. 21	Mar. 15
Lesser Scaup Duck	Mar. 8	Mar. 13	Mar. 21
Rusty Blackbird	Mar. 10	Mar. 7	Mar. 12
Herring Gull	Mar. 10	Mar. 31	Feb. 2
*Sparrow Hawk	Mar. 10	Mar. 6	Mar. 7
Red-head Duck	Mar. 10		Apr. 4
*Golden-crowned Kinglet	Mar. 11	Mar. 18	Mar. 3
Wilson Snipe	Mar. 12	Apr. 18	Apr. 4
Red-tailed Hawk	Mar. 19	Mar. 7	Mar. 12
Towhee	Mar. 19	Mar. 26	Mar. 15
Phoebe	Mar. 20	Mar. 27	Mar. 13
Cowbird	Mar. 20	Mar. 23	Mar. 12
Yellow-bellied Sapsucker	Mar. 24	Apr. 4	Mar. 27
Fox Sparrow	Mar. 25	Mar. 8	Mar. 22
Hermit Thrush	Mar. 25	Apr. 5	Mar. 24
Vesper Sparrow	Mar. 25	Apr. 4	Mar. 24
Tree Swallow	Mar. 25	Mar. 27	Mar. 29
Buffle-head Duck	Mar. 26	Apr. 11	Mar. 29
Chipping Sparrow	Mar. 27	Apr. 3	Mar. 24
Field Sparrow	Mar. 27	Apr. 2	Mar. 28
Swamp Sparrow	Mar. 27	Apr. 7	Mar. 29
Baldpate	Mar. 28	Apr. 15	

Pied-billed Grebe	Mar. 28	Mar. 27	Mar. 12
Woodcock	Mar. 30	Mar. 28	Mar. 22
Osprey	Apr. 3	Apr. 11	Apr. 16
Ruby-crowned Kinglet	Apr. 3	Apr. 14	Apr. 14
Bittern	Apr. 4	Apr. 24	Apr. 4
Brown Thrasher	Apr. 4	Apr. 12	Apr. 9
Loon	Apr. 5	Apr. 5	Mar. 8
Red-shouldered Hawk	Apr. 8	Mar. 6	Feb. 22
House Wren	Apr. 8	Apr. 28	Mar. 29
Long-billed Marsh Wren	Apr. 10	May 31	May 9
Great Blue Heron	Apr. 10	Mar. 24	Mar. 20
Cooper's Hawk	Apr. 10	May 2	Mar. 23
Migrant Shrike	Apr. 11		Apr. 16
Myrtle Warbler	Apr. 12	Apr. 12	Apr. 19
Bank Swallow	Apr. 12	Apr. 23	Apr. 13
Barn Swallow	Apr. 12	Apr. 11	Apr. 13
Ruddy Duck	Apr. 12	Apr. 13	Apr. 13
*Black Duck	Apr. 12	Mar. 27	Mar. 28
*Mallard	Apr. 13		Apr. 12
Coot	Apr. 13	Apr. 10	Apr. 4
Purple Martin	Apr. 13	Apr. 18	Apr. 25
Spotted Sandpiper	Apr. 15	Apr. 20	Apr. 26
Bartramian Sandpiper	Apr. 15		
Grasshopper Sparrow	Apr. 16	May 19	May 23
White-throated Sparrow	Apr. 16	Apr. 18	Apr. 16
Pectoral Sandpiper	Apr. 16		
Rough-winged Swallow	Apr. 17	May 1	Apr. 29
Cliff Swallow	Apr. 17	May 1	Apr. 23
Greater Yellow-legs	Apr. 22	May 4	Apr. 7
Lesser Yellow-legs	Apr. 22	Apr. 18	Apr. 17
Solitary Sandpiper	Apr. 23	May 8	Apr. 27
Chimney Swift	Apr. 23	Apr. 24	Apr. 24
Horned Grebe	Apr. 23	Apr. 14	Apr. 12
Black-crowned Night Heron	Apr. 25		May 3
Winter Wren	Apr. 28	Mar. 7	Mar. 22
*Red-headed Woodpecker	Apr. 29	Apr. 4	Apr. 23
Virginia Rail	Apr. 29	Apr. 23	Apr. 22
Palm Warbler	Apr. 29	Apr. 28	Apr. 23
Yellow Warbler	Apr. 30	Apr. 28	Apr. 22
Black-throated Green Warbler	Apr. 30	May 6	Apr. 23
Black and White Warbler	Apr. 30	May 2	Apr. 19
Blue-gray Gnatcatcher	Apr. 30	May 2	Apr. 19
*Purple Finch	Apr. 30	Apr. 11	Mar. 8
Green Heron	Apr. 30	May 8	Apr. 22
Lark Sparrow	Apr. 30		May 15

Bobolink	Apr. 30	May 5	Apr. 22
Catbird	May 1	May 4	Apr. 13
Northern Yellow-throat	May 1	May 4	Apr. 25
Oven-bird	May 1	Apr. 25	May 9
Bonaparte's Gull	May 2		May 9
*Merganser	May 3	Mar. 27	Jan. 27
Blue-headed Vireo	May 3	May 6	
Sora Rail	May 3	Apr. 30	Apr. 13
Savannah Sparrow	May 4	Apr. 14	
Least Flycatcher	May 4	May 6	Apr. 26
Baltimore Oriole	May 4	May 1	Apr. 24
Pipit	May 4		
King Rail	May 4	June 24	
Sharp-shinned Hawk	May 4	May 2	Apr. 13
Wood Thrush	May 5	Apr. 25	Apr. 29
Rose-breasted Grosbeak	May 6	May 5	May 3
Warbling Vireo	May 6	May 6	Apr. 25
Louisiana Water-thrush	May 8	Apr. 28	Apr. 26
Sycamore Warbler	May 8		Apr. 26
Nashville Warbler	May 8	May 7	Apr. 27
Grey-cheeked Thrush	May 8	May 5	Apr. 25
Wilson's Thrush	May 8	May 6	Apr. 27
White-crowned Sparrow	May 10	Apr 30	May 3
Kingbird	May 11	May 1	Apr. 26
Whip-poor-will	May 11	May 12	Apr. 19
Chestnut-sided Warbler	May 11	May 6	May 12
Red-breasted Nuthatch	May 11		
Crested Flycatcher	May 11	May 6	May 12
Red-eyed Vireo	May 12	May 12	May 12
Cerulean Warbler	May 13	June 6	May 16
Blackburnian Warbler	May 14	May 6	May 8
Golden-winged Warbler	May 14	May 6	May 15
Redstart	May 14	May 2	May 11
Indigo Bunting	May 14	May 15	May 15
Least Bittern	May 14	June 8	May 1
Black Tern	May 15	June 26	
Black-throated Blue Warbler	May 15	May 5	Apr. 25
Yellow-throated Vireo	May 15	May 6	Apr. 26
Turkey Vulture	May 15	June 6	May 10
Orchard Oriole	May 16	May 13	May 15
Tennessee Warbler	May 16	May 7	May 12
Common Tern	May 16	Apr. 24	Apr. 12
Magnolia Warbler	May 16	May 6	May 11
Olive-backed Thrush	May 17	May 2	May 2

Scarlet Tanager	May 17	May 7	May 11
Wood Pewee	May 17	May 16	May 2
Cape May Warbler	May 17	May 6	May 15
Ruby-throated Hummingbird	May 19	May 12	Apr. 25
Bay-breasted Warbler	May 21	May 14	May 13
Black-billed Cuckoo	May 19	May 18	May 16
Yellow-billed Cuckoo	May 21	May 29	May 16
Black-poll Warbler	May 21		May 15
Nighthawk	May 23	May 29	May 17
Northern Parula Warbler	May 24	May 12	May 16
Wilson's Warbler	May 24	May 18	May 15
Canadian Warbler	May 27	May 6	May 11
Connecticut Warbler	May 28		May 17
Mourning Warbler	June 2	May 25	May 24

BIRD NOTES FROM PINEHURST, NORTH CAROLINA.

BY C. J. PENNOCK.

Following is a summary of my notes taken at Pinehurst, Moore County, N. C., during a stay there from February 9, to March 17, 1910.

This attractive winter resort settlement is about seventy-five miles south of Raleigh, forty miles from the South Carolina state line, and nearly one hundred miles north-west from Wilmington, at or near the sea coast. The elevation is about 650 feet above sea level and is in the Long Leaf Pine (*P. taeda*) district. Until within twenty years or so turpentine making was the principal industry of the region. With the building of a railroad the timber has been largely cut off, and later, devastating fires of frequent recurrence have made a most desolate looking country of much of the surrounding region. The aspect is rolling and many small streams are present. The soil is sandy, and excepting in few instances agricultural improvement has made slight progress. *Pinus taeda*, *P. echinata*, White Oak (*Q. alba*), Post Oak (*Q. obtusiloba*), Black Jack (*Q. nigra*) on the higher lands, and Sweet-Gum (*Liquidambar styraciflua*), Black-Gum (*Nyssa multiflora* and *N. uniflora*), Magnolia glauca and Tulip-trees